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SCIENTIFIC ACTIVITY OF ACADEMICIAN I. V. GORBENSHNIKOV

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Il'ya Vasil'yevich Grebenshchikov was born 25 June 1887 in Petersburg. His father was a doctor working in medical statistics.

Grebenshchikov studied at the University of Petersburg, where he took courses in organic, analytical, technical, inorganic, and physical chemistry. In 1909, before he finished at the University, he became a research worker in the Central Chemical Laboratory of the Okhtenskiy Powder Plant. Here he did some independent work on the properties of Russian powders and on the calorific value of coal.

In 1910 he brilliantly completed his university studies. He received his degree, cum laude, for his work in the physical-chemical laboratory of the Electrotechnical Institute on The Influence of Pressure upon the Equilibrium of the Liquid-Crystal Phase of Para-azobenzol. He was closely allied with the Electrotechnical Institute for more than 20 years, first as an assistant, then teacher, and finally in 1923 as Professor of the Chair of Physical Chemistry and Theoretical Electrochemistry.

Working with M. A. Pushin at the Institute, he carried out a number of experimental works having considerable importance in the study of heterogeneous equilibria and liquid structures. These works, initiated by the new concepts of physical-chemical analysis held at that time by M. S. Kurnakov, determined the scientific interests of Grebenshchikov for a good many years and gave him practice in setting up accurate scientific experiments.

He worked out a manometric procedure and a completely original pyrometric procedure for determining phase transitions. He set up Pt-diagrams for certain organic substances and also a number of binomial systems, which in 1911 was one of the first investigations of its kind.

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In 1910 - 1911, with the aid of a high-pressure cylinder, Grebenshchikov studied the phenomenon of adiabatic expansion of water, phenol, and other substances.

In 1915, because of the tremendous need for optical glass, a plant for optical glass production was opened under the direction of N. N. Kachalov. Grebenshchikov was directly entrusted with glass melting. He went to Chance's in Birmingham, England, to study trade secrets. His own operations were very successful.

On 15 December 1916, the State Optical Institute was founded and Grebenshchikov headed its chemical laboratory (now the Laboratory of Physicochemical Equilibrium). Since 1918 he has devoted his scientific activity exclusively to problems of optical glass melting and the optical-mechanical industry in general. The main scientific problem to which he devoted 30 years of his life is the problem of glass in all of its aspects.

When the Leningrad Optical Glass Factory (LENZOS) was reopened, 16 November 1923, after 3 years of idleness, N. N. Kachalov was named technical director and Grebenshchikov and D. S. Rozhdestvenskiy were appointed plant consultants. Grebenshchikov carried on scientific investigations in his large, well-equipped plant laboratory. In May 1926, he went to Germany to procure scientific equipment for LENZOS. Grebenshchikov was also consultant of the IZOS.

Grebenshchikov devoted a great deal of time to his own creation, the Laboratory of Physicochemical Equilibrium of the Silicate Systems in the State Optical Institute. The laboratory has many offshoots: Laboratory of Heating Processing of Glass, under Prof V. V. Vargin, Doctor of Technical Sciences; Laboratory of Cold Processing of Glass, under the late N. A. Mosavall; Laboratory of Physical Properties of Glass, under A. I. Stozharov; Laboratory of Coatings Over Metals, under Prof A. G. Samartsev, Doctor of Chemical Sciences. All of these laboratory heads began their scientific work under Grebenshchikov and may be called his pupils, as it were.

In 1933, Grebenshchikov organized the Laboratory of Silicate Chemistry in the Academy of Sciences USSR. Here, he posed new problems, worked out new methods of physicochemical investigations which were later applied in industry and in other branches of the Institute. The physicochemical composition of glaze (enamel, lacquer) for high-voltage porcelain (V. P. Barsakovskiy, L. Yu. Kurtts, S. K. Dubrovo) were investigated in this laboratory.

The work on silico-organic compounds which he began in the Laboratory of Silicate Chemistry is carried on in GOI where he synthesized the ethyl ester of ortho-titanic acid.

For some years he studied the varied properties of the ternary system $\text{Na}_2\text{O} - \text{PbO} - \text{SiO}_2$. Assisting him in this work were K. A. Krakau, K. S. Yevstrop'yev, L. Yu. Kurtts, S. Ye. Krasikov, N. A. Tudorovskaya, N. V. Suykovskaya, Ye. Ya. Mukhin, M. S. Genrikh, V. A. Ioffe, M. M. Skornyakov, B. A. Pospelov, N. N. Valenkov, Ye. A. Toray-Koshits, N. A. Vakhramayev, and A. A. Appen.

Early in his career at LENZOS, Grebenshchikov studied the influence of the composition of glass upon its optical constants. Later, in collaboration with Doctor of Sciences K. S. Yevstrop'yev, he did considerable work in creating new types of optical glass. In addition to silicate glasses, he worked on non-silicate glass (boric glass -- in collaboration with E. O. Bresker and M. S. Genrikh; porcelain glass -- A. Ya. Kuznetsov and N. V. Golubeva; glass with rare earths -- R. O. Bresker and M. S. Genrikh; germanic glass -- K. A. Krakau and M. S. Genrikh).

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Grebenshchikov also worked out a method of obtaining optically uniform glass in small laboratory crucibles. K. S. Yevstropiyev and M. M. Skornyakova were his co-workers.

With a group of co-workers he carried on considerable work on glass-gas systems in order to explain glass bubbles and methods of eliminating them.

A. A. Lobedev started his important investigations while working under Grebenshchikov.

Grebenshchikov discovered a new ultraboreous type of glass and studied intensively the surface properties of this glass with the assistance of N. F. Timofeyeva.

Assisted by N. V. Suykovskaya, V. S. Melchanov, G. S. Melchanova, and V. G. Vcano, Grebenshchikov solved the problem of "sweat" on optical glass.

With the assistance of N. V. Suykovskaya, T. V. Obyedkova, and V. T. Slavyanskiy, he worked out two methods for coating glass.

In addition to his work in optical glass, Grebenshchikov devoted a great deal of time to the problem of grinding and polishing metals. It was he who developed the GOI pastes. In the metals phase of his work he was assisted by V. P. Lavrov, S. V. Kramelov, and B. M. Markvin.

In 1939 he received the Order of Worker of the Red Banner.

During the war he organized the production of optical glass in an Eastern plant at Noshka. During the war he was consultant for all optical-mechanical plants in Sverdlovsk, Omsk, Novosibirsk, and Tomsk.

In 1942 he received the Order of the Red Star and the Stalin Prize for his scientific works in the field of optics which had great military importance.

In 1943, in connection with the 25th Jubilee of the State Optical Institute, Grebenshchikov received the Order of Lenin.

He has been active in the Academy of Sciences USSR since the day of his appointment. He became secretary of the Technical Group of the OThN when it was organized in 1932. In 1936, he was selected as assistant to the secretary of the newly organized Department of Technical Sciences and as president of the OTN Group of Technical Chemistry and Metallurgy.

When the independent Department of Chemical Sciences was organized, Grebenshchikov was selected as a member of the Bureau of the OThN and somewhat later as director of the Institute of General and Inorganic Chemistry.

In 1945, he was presented the Order of the Patriotic War, First Class.

He is president of the section of general chemistry in the Leningrad Department of the Mendeleev Chemical Society and a member of the editorial staff of a number of scientific journals.

On 26 June 1947 he was awarded his second Order of Lenin.

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